

Appl. No. 10/712,691
Attorney Docket No. Serie 6053
Amdt. dated October 25, 2006
Reply to Office Action of August 2, 2006

Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

Claims 1 – 14 (cancelled)

Claim 15 (previously presented): A catalytic composition for the partial oxidation of light hydrocarbon mixtures which comprises:

- i) a perovskite crystallographic structure; and
- ii) a nickel metal.

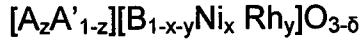
Claim 16 (previously presented): The composition according to Claim 15, wherein said composition further comprises:

- iii) a rhodium metal.

Claim 17 (previously presented): A catalytic composition for the partial oxidation of light hydrocarbon mixtures which comprises:

- i) a perovskite crystallographic structure; and
- ii) a rhodium metal.

Claim 18 (currently amended): The composition according to Claim 15, wherein said perovskite compound crystallographic structure further comprises formula (I):



wherein said A and said A' each comprise at least one component selected from the group consisting of the lanthanide family, the actinide family, and group [[II_a]]
IIa,

wherein said B is at least one component selected from the transition metal groups of columns Ib, IIb, IIIb, IVb, Vb, VIb, VIIb, and VIIIb,

wherein $0 < x \leq 0.7$,

wherein $0 < y \leq 0.5$,

wherein $0 \leq x+y \leq 0.8$,

wherein $0 \leq z \leq 1$, and

wherein said δ is adjusted so as to obtain the electric neutrality of said perovskite compound.

Claim 19 (previously presented): The composition according to Claim 18, wherein said A and said A' each comprise at least one component selected from the group consisting of:

- i) La;
- ii) Ce;
- iii) Ca; and
- iv) Sr.

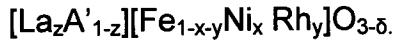
Claim 20 (previously presented): The composition according to Claim 19, wherein said A is La.

Claim 21 (previously presented): The composition according to Claim 18, wherein said B is at least one component selected from the group consisting of:

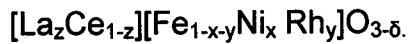
- i) Mn;
- ii) Fe;
- iii) Co; and
- iv) Al.

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Claim 22 (currently amended): The composition according to Claim 18, wherein said perovskite compound crystallographic structure further comprises formula (la):



Claim 23 (currently amended): The composition according to Claim 18, wherein said perovskite compound crystallographic structure further comprises formula (lb):



Claim 24 (previously presented): The composition according to Claim 18, wherein $0 < x \leq 0.5$.

Claim 25 (previously presented): The composition according to Claim 18, wherein $0 < y \leq 0.25$.

Claim 26 (previously presented): The composition according to Claim 18, wherein $z < 1$.

Claim 27 (previously presented): The composition according to Claim 22, wherein said formula (la) comprises about $\text{La}_{0.7}\text{Fe}_{0.25}\text{Ni}_{0.25}\text{Rh}_{0.05}\text{O}_{3-\delta}$.

Claim 28 (previously presented): The composition according to Claim 23, wherein said formula (lb) comprises about $\text{La}_{0.8}\text{Ce}_{0.2}\text{Fe}_{0.7}\text{Ni}_{0.25}\text{Rh}_{0.05}\text{O}_{3-\delta}$.

Claim 29 (previously presented): The composition according to Claim 28, wherein said formula (lb) comprises about $\text{La}_{0.8}\text{Ce}_{0.2}\text{Fe}_{0.7}\text{Ni}_{0.3}\text{O}_{3-\delta}$.

Claim 30 (currently amended): The composition according to Claim 15, wherein the said partial oxidation of light hydrocarbon mixtures occurs when an operating temperature of the catalyst is in the range of about 500 to about 1300 °C.

Claim 31 (currently amended): The composition according to Claim 30, wherein said operating temperature of the catalyst is in the range of about 600 to about 1100 °C.

Claim 32 (currently amended): The composition according to Claim 15, wherein the said partial oxidation of light hydrocarbon mixtures occurs when an operating pressure of the catalyst is in the range of about 10^5 Pa to about 3×10^6 Pa.

Claim 33 (currently amended): The composition according to Claim 32, wherein said operating pressure of the catalyst is in the range of about 10^5 Pa to about 10^6 Pa.

Claim 34 (currently amended): The composition according to Claim 15, wherein said partial oxidation process further comprises at least one oxidant gaseous feed selected from the group consisting of:

- i) oxygen;
- ii) oxygen and an inert gas mixture; and
- iii) steam and carbon dioxide.

Claim 35 (previously presented): The composition according to Claim 15, wherein said light hydrocarbon mixture to be partially oxidized further comprises natural gas.

Claim 36 (previously presented): A method for making a catalytic composition for the partial oxidation of light hydrocarbon mixtures which comprises the steps of:

- i) introducing a perovskite crystallographic structure; and
- ii) adding a nickel metal.

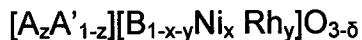
Claim 37 (previously presented): The method according to Claim 36, wherein said method further comprises:

- iii) adding a rhodium metal.

Claim 38 (previously presented): A method for making a catalytic composition for the partial oxidation of light hydrocarbon mixtures which comprises the steps of:

- i) introducing a perovskite crystallographic structure; and
- ii) adding a rhodium metal.

Claim 39 (currently amended): The method according to Claim 36, wherein said perovskite compound crystallographic structure further comprises formula (I):



wherein said A and said A' each comprise at least one component selected from the group consisting of the lanthanide family, the actinide family, and group [[II_a]] II_a,

wherein said B is at least one component selected from the transition metal groups ~~of columns~~ Ib, IIb, IIIb, IVb, Vb, VIb, VIIb, and VIIIb,

wherein $0 < x \leq 0.7$,

wherein $0 < y \leq 0.5$,

wherein $0 \leq x+y \leq 0.8$,

wherein $0 \leq z \leq 1$, and

wherein said δ is adjusted so as to obtain the electric neutrality of said perovskite compound.

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Claim 40 (previously presented): The method according to Claim 39, wherein said A and said A' each comprise at least one component selected from the group consisting of:

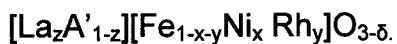
- i) La;
- ii) Ce;
- iii) Ca; and
- iv) Sr.

Claim 41 (previously presented): The method according to Claim 40, wherein said A is La.

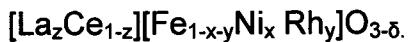
Claim 42 (previously presented): The method according to Claim 39, wherein said B is at least one component selected from the group consisting of:

- i) Mn;
- ii) Fe;
- iii) Co; and
- iv) Al.

Claim 43 (currently amended): The method according to Claim 39, wherein said perovskite compound crystallographic structure further comprises formula (Ia):



Claim 44 (currently amended): The method according to Claim 39, wherein said perovskite compound crystallographic structure further comprises formula (Ib):



Claim 45 (previously presented): The method according to Claim 39, wherein $0 < x \leq 0.5$.

Claim 46 (previously presented): The method according to Claim 39, wherein $0 < y \leq 0.25$.

Claim 47 (previously presented): The method according to Claim 39, wherein $z < 1$.

Claim 48 (currently amended): The method according to Claim 43, ~~wherein said method comprises further comprising~~ about $\text{La Fe}_{0.7} \text{ Ni}_{0.25} \text{ Rh}_{0.05} \text{ O}_{3-\delta}$.

Claim 49 (currently amended): The method according to Claim 44, ~~wherein said method comprises further comprising~~ about $\text{La}_{0.8} \text{ Ce}_{0.2} \text{ Fe}_{0.7} \text{ Ni}_{0.25} \text{ Rh}_{0.05} \text{ O}_{3-\delta}$.

Claim 50 (currently amended): The method according to Claim 49, ~~wherein said method comprises further comprising~~ about $\text{La}_{0.8} \text{ Ce}_{0.2} \text{ Fe}_{0.7} \text{ Ni}_{0.3} \text{ O}_{3-\delta}$.

Claim 51 (previously presented): The method according to Claim 36, wherein the operating catalyst condition is in the range of about 500 to about 1300°C.

Claim 52 (previously presented): The method according to Claim 51, wherein said catalyst condition is in the range of about 600 to about 1100° C.

Claim 53 (previously presented): The method according to Claim 36, wherein the operating catalyst condition is in the range of about 10^5 Pa to about 3×10^6 Pa.

Claim 54 (previously presented): The method according to Claim 53, wherein said catalyst condition is in the range of about 10^5 Pa to about 10^6 Pa.

Claim 55 (previously presented): The method according to Claim 36, wherein the partial oxidation requires adding an oxidant gaseous feed that comprises at least one component selected from the group consisting of:

- i) oxygen;
- ii) oxygen and an inert gas mixture; and
- iii) steam and carbon dioxide.

Claim 56 (previously presented): The method according to Claim 36, wherein said light hydrocarbon mixture comprises natural gas subjected to at least one process selected from the group consisting of:

- i) partial oxidation;
- ii) reforming (steam or dry);
- iii) selective oxidation;
- iv) hydrogenation reaction; and
- v) dehydrogenated oxidative reaction.